

CLAIMS

1. A turbocharger comprising a turbine wheel mounted to a first end of a shaft for rotation within a turbine housing, and a compressor wheel mounted to a second end of the shaft for rotation within a compressor housing, the compressor wheel having an axial through bore extending between a first end of the wheel and a second end of the wheel, said second end being remote from said turbine, wherein the second end of the shaft extends through the bore and a short distance beyond the second end of the compressor wheel and a nut is threaded onto said second end of the shaft to apply a clamping force to the compressor wheel either directly, or indirectly through an intermediate clamping member disposed around said shaft adjacent the second end of the compressor wheel, such that the second end of the compressor wheel has a radial surface contacting a radial surface of the nut or intermediate clamping member, and wherein at least one of said radial surfaces is treated to increase its co-efficient of friction with respect to the other surface.
2. A turbocharger according to claim 1, wherein both of said surfaces are treated.
3. A turbocharger according to claim 1, wherein said surface treatment comprises laser etching.
4. A turbocharger according to claim 1, wherein said surface treatment comprises mechanical abrasion of the or each surface.
5. A turbocharger according to claim 1, wherein said surface treatment comprises a chemical etching or abrasion process.
6. A turbocharger according to any preceding claim, wherein said first end of the compressor wheel is a radial surface which abuts a radial surface defined by the shaft or a thrust bearing assembly mounted on the shaft, and wherein at least one of said surfaces is treated to increase its co-efficient of friction with respect to the other surface.

7. In a turbocharger comprising a turbine wheel mounted to one end of a shaft for rotation within a turbine housing, and a compressor wheel mounted to the other end of the shaft for rotation within a compressor housing, the compressor wheel having an axial through bore extending between a first end of the wheel and a second end of the wheel, said second end being remote from said turbine, wherein the second end of the shaft extends through the bore and a short distance beyond the second end of the compressor wheel and a nut is threaded onto said second end of the shaft to apply a clamping force to the compressor wheel either directly or indirectly through an intermediate clamping member disposed around said shaft adjacent the second end of the compressor wheel, such that the second end of the compressor wheel has a radial surface contacting a radial surface of the nut or intermediate clamping member; a method comprising:

treating at least one of said radial surfaces to increase its co-efficient of friction with respect to the other.

8. A method according to claim 7, wherein said treatment increases the surface roughness of the respective radial surface.

9. A method according to claim 7, wherein said surface treatment comprises laser etching a pattern into the respective surface.

10. A method according to claim 7, wherein said surface treatment comprises mechanical abrasion of the or each surface.

11. A method according to claim 7, wherein said surface treatment comprises chemical etching or abrasion of the or each surface.

12. A method according to claim 7, wherein said surface treatment is applied to both of said radial contact surfaces.

13. A method according to claim 7, wherein the first end of the compressor wheel has a radial surface contacting a radial surface defined by the shaft or a thrust bearing assembly mounted on the shaft, and at least one of said surfaces is treated to increase its co-efficient of friction with respect to the other.